

Borehole

50-01-09**Log Event A****Borehole Information**

Farm : <u>T</u>	Tank : <u>T-101</u>	Site Number : <u>299-W10-104</u>
N-Coord : <u>43,685</u>	W-Coord : <u>75,680</u>	TOC Elevation : <u>673.17</u>
Water Level, ft : <u>83.3</u>	Date Drilled : <u>8/31/1973</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.237</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>96</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>96</u>	

Cement Bottom, ft. : 96 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-01-09 was originally drilled in August 1973 and completed to a depth of 96 ft using 6-in.-diameter casing. In September 1980, the original 6-in. casing was perforated from 0 to 20 ft and 92 to 94 ft, a 4-in. casing was installed inside the 6-in. casing, and the annular space was filled with grout.

The zero reference for the SGLS was the top of the 4-in. casing, which is approximately even with the ground surface.

Equipment Information

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency : <u>35.0 %</u>
Calibration Date : <u>11/1997</u>	Calibration Reference : <u>GJO-HAN-20</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>06/23/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>11.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>06/24/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>10.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>21.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

50-01-09**Log Event A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>06/24/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>20.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>R</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>24.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>4</u>	Log Run Date :	<u>06/24/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>23.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>68.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>5</u>	Log Run Date :	<u>06/25/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>92.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>67.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged in five log runs. The total logging depth reached by the SGLS was 92.0 ft. Log run five was collected using real time for 200 s because of the excessive dead time between 20 and 24 ft. During logging, this borehole contained standing water below 83.3 ft.

Analysis Information

Analyst : R.R. SpatzData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 08/31/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

The casing correction factor for a 0.517-in.-thick steel casing was applied to the concentration data during the analysis process. A grout correction was not made because none is available. A general water correction was applied to the data for the 8.7-ft water-filled interval at the bottom of the borehole.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the

Borehole

50-01-09

Log Event A

spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot that compares spectral gamma-ray data from a 1992 RLS survey and a 1998 SGLS survey is included.

A time-sequence plot of selected historical gross gamma-ray data collected between 1975 and 1994 is also included.

Results/Interpretations:

The radionuclide concentrations identified in this section are reported as apparent concentrations only and are underestimated.

The man-made radionuclides Cs-137, Co-60, and Eu-154 were detected around this borehole. The Cs-137 contamination was detected continuously from the ground surface to 8.5 ft at concentrations ranging from 0.2 to 4 pCi/g. Continuous Cs-137 contamination was detected between 12.5 and 27 ft at concentrations ranging from just above 0.2 to over 318 pCi/g. Cs-137 contamination was detected at 34 ft with a concentration of 1 pCi/g. The maximum apparent Cs-137 concentration for this borehole was 318.6 pCi/g detected at 21.5 ft.

Co-60 contamination was detected at 29 ft with a concentration of 0.1 pCi/g. Continuous Co-60 contamination was measured between 35 and 48 ft, ranging from 0.15 pCi/g to just over 1 pCi/g. The Co-60 concentrations between 68.5 and 87 ft ranged from 0.06 to 0.22 pCi/g. The maximum Co-60 concentration for this borehole was 1.34 pCi/g detected at 36 ft.

Eu-154 contamination was detected from 21 to 21.5 ft at concentrations ranging from 0.6 to 1.06 pCi/g.

K-40 concentrations increased from a general background of about 10 pCi/g above 38 ft to about 13 pCi/g between 38 and 48 ft. The K-40 concentration between 48 and 65 ft decreased to about 10 pCi/g. Between 68 and 90 ft, the K-40 concentrations were about 12 pCi/g. U-238 and Th-232 concentrations increased between 82 and 90 ft. Below 90 ft, the KUT concentrations decreased.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks T-101 and T-102.